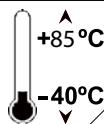


Wide Operating
Temperature

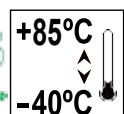


COM-652E

**Wide Range Temperature
COM Express Type 2 CPU Module**

User's Manual

Version 1.0



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Chapter 1

Introduction

1.1 Copyright Notice

All Rights Reserved.

The information in this document is subject to change without prior notice in order to improve the reliability, design and function. It does not represent a commitment on the part of the manufacturer.

Under no circumstances will the manufacturer be liable for any direct, indirect, special, incidental, or consequential damages arising from the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

1.2 Declaration of Conformity

CE

The CE symbol on your product indicates that it is in compliance with the directives of the Union European (EU). A Certificate of Compliance is available by contacting Technical Support.

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend the use of shielded cables. This kind of cable is available from ARBOR. Please contact your local supplier for ordering information.

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

Warning

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

FCC Class A

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) This device must accept any interference received, including interference that may cause undesired operation.

NOTE:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RoHS

ARBOR Technology Corp. certifies that all components in its products are in compliance and conform to the European Union's Restriction of Use of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive 2002/95/EC.

The above mentioned directive was published on 2/13/2003. The main purpose of the directive is to prohibit the use of lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB), and polybrominated diphenyl ethers (PBDE) in electrical and electronic products. Member states of the EU are to enforce by 7/1/2006.

ARBOR Technology Corp. hereby states that the listed products do not contain unintentional additions of lead, mercury, hex chrome, PBB or PBDB that exceed a maximum concentration value of 0.1% by weight or for cadmium exceed 0.01% by weight, per homogenous material. Homogenous material is defined as a substance or mixture of substances with uniform composition (such as solders, resins, plating, etc.). Lead-free solder is used for all terminations (Sn(96-96.5%), Ag(3.0-3.5%) and Cu(0.5%)).

SVHC / REACH

To minimize the environmental impact and take more responsibility to the earth we live, Arbor hereby confirms all products comply with the restriction of SVHC (Substances of Very High Concern) in (EC) 1907/2006 (REACH --Registration, Evaluation, Authorization, and Restriction of Chemicals) regulated by the European Union.

All substances listed in SVHC < 0.1 % by weight (1000 ppm)

1.3 About This User's Manual

This user's manual provides general information and installation instructions about the product. This User's Manual is intended for experienced users and integrators with hardware knowledge of personal computers. If you are not sure about any description in this booklet, please consult your vendor before further handling.

1.4 Warning

Single Board Computers and their components contain very delicate Integrated Circuits (IC). To protect the Single Board Computer and its components against damage from static electricity, you should always follow the following precautions when handling it :

1. Disconnect your Single Board Computer from the power source when you want to work on the inside.
2. Hold the board by the edges and try not to touch the IC chips, leads or circuitry.
3. Use a grounded wrist strap when handling computer components.
4. Place components on a grounded antistatic pad or on the bag that comes with the Single Board Computer, whenever components are separated from the system.

1.5 Replacing the Lithium Battery

Incorrect replacement of the lithium battery may lead to a risk of explosion.

The lithium battery must be replaced with an identical battery or a battery type recommended by the manufacturer.

Do not throw lithium batteries into the trash-can. It must be disposed of in accordance with local regulations concerning special waste.

1.6 Technical Support

If you have any technical difficulties, please do not hesitate to call or e-mail our customer service.

<http://www.arbor.com.tw>

E-mail:info@arbor.com.tw

1.7 Warranty

This product is warranted to be in good working order for a period of two years from the date of purchase. Should this product fail to be in good working order at any time during this period, we will, at our option, replace or repair it at no additional charge except as set forth in the following terms. This warranty does not apply to products damaged by misuse, modifications, accident or disaster.

Vendor assumes no liability for any damages, lost profits, lost savings or any other incidental or consequential damage resulting from the use, misuse of, or inability to use this product. Vendor will not be liable for any claim made by any other related party.

Vendors disclaim all other warranties, either expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose, with respect to the hardware, the accompanying product's manual(s) and written materials, and any accompanying hardware. This limited warranty gives you specific legal rights.

Return authorization must be obtained from the vendor before returned merchandise will be accepted. Authorization can be obtained by calling or faxing the vendor and requesting a Return Merchandise Authorization (RMA) number. Returned goods should always be accompanied by a clear problem description.

1.8 Packing List

Packing List

Before you begin installing your single board, please make sure that the following materials have been shipped:



1 x COM Express CPU Module



1 x Driver CD



1 x Quick Installation Guide

If any of the above items is damaged or missing, contact your vendor immediately.

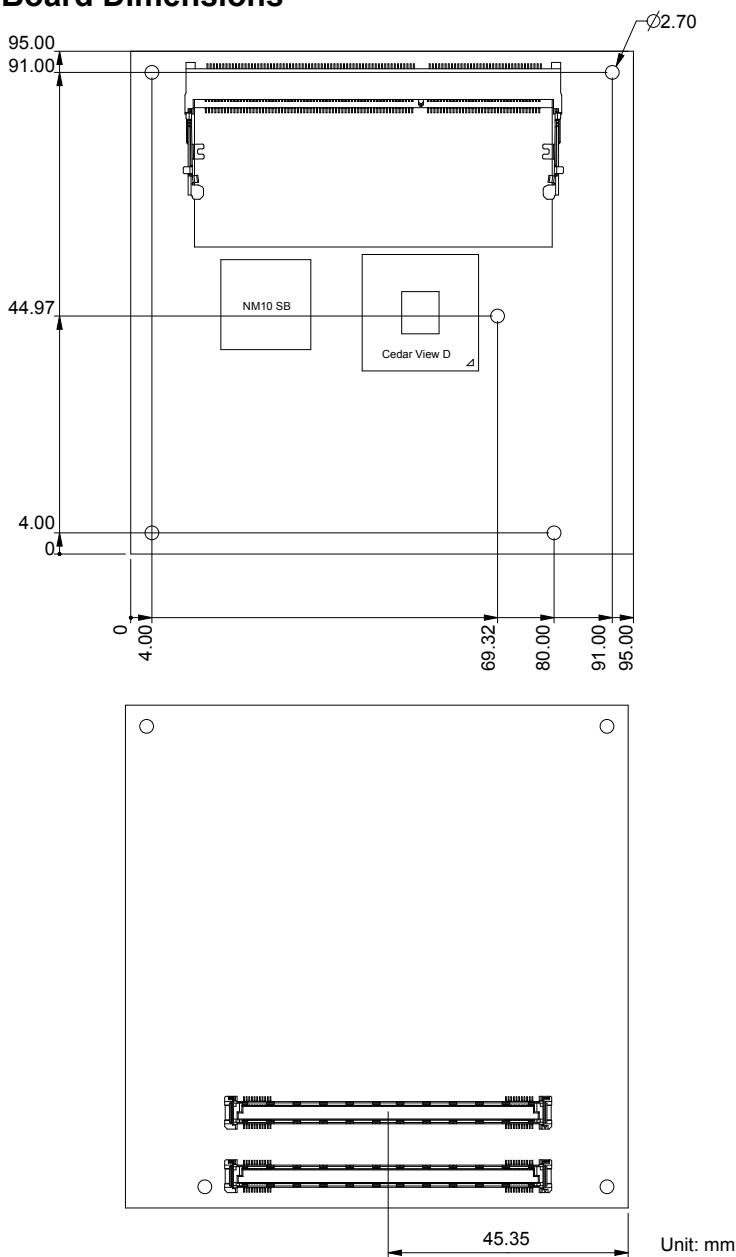
1.9 Ordering Information

COM-652E-N26	Intel® Atom™ N2600 1.6GHz COM Express Compact CPU module
COM-652E-D25	Intel® Atom™ D2550 1.86GHz COM Express Compact CPU module
HS-2503-F1	Heat spreader (95 x 95 x18mm)
HS-2503-W1	Heatsink wave type (95 x 95 x 40mm)
PBE-1700-F R1.3	COM Express Type 2 evaluation board in ATX form factor w/ F71869 Super IO
CBK-04-1700-00	Cable kit 1 x SATA cable 1 x COM port cable 1 x FDD cable 1 x IDE cable

1.10 Specifications

Form Factor	COM Express Type 2 CPU Module
CPU	Soldered onboard Intel® Atom™ N2600 1.6GHz or D2550 1.86GHz processor
Chipset	Intel® PCH NM10
System Memory	1 x DDR3 SO-DIMM socket, supporting 1066MHz SDRAM up to 4GB (D2550)/ 2GB (N2600)
Graphics	<ul style="list-style-type: none"> • Integrated Intel® GMA 3650 (Gfx frequency 640MHz) for D2550 processor • Integrated Intel® GMA 3600 (Gfx frequency 400MHz) for N2600 processor
Display	<ul style="list-style-type: none"> • Support Analog RGB • LCD: Single Channel 18-bit for N2600 processor/ 24-bit for D2550 processor • Support dual independent displays
Ethernet controller	1 x Intel® 82583V PCIe Gigabit Ethernet controller
BIOS	AMI® UEFI BIOS
Storage	2 x Serial ATA ports with 300MB/s HDD transfer rate
Digital I/O	8-bit programmable Digital Input/Output
Universal Serial Bus	8 x USB 2.0 ports
Expansion Interface	<ul style="list-style-type: none"> • 2 x PClex1 lanes • 4 x PCI masters • SPI and LPC (Low Pin Count) interfaces
Operating Temp.	-40°C ~ 85°C (-40°F ~ 185°F)
Operating Humidity	0 ~ 95% (non-condensing)
Watchdog Timer	1~ 255 levels reset
Dimension (L x W)	95 x 95 mm (3.7" x 3.7")

1.11 Board Dimensions





Chapter 2

Installation

2.1 What is “COM Express”?

With more and more demands on small and embedded industrial boards, a multi-functioned COM (Computer-on-Module) is the great one of the solutions.

COM Express, board-to-board connectors consist of two rows of 220 pins each.

Row AB, which is required, provides pins for PCI Express, SATA, LVDS, LCD channel, LPC bus, system and power management, VGA, LAN, and power and ground interfaces.

Row CD, which is optional, provides SDVO and legacy PCI and IDE signals next to additional PCI Express, LAN and power and ground signals.

By the way, the target markets of COM will be focused on:

- Retail & Advertising
- Medical
- Test & Measurement
- Gaming & Entertainment
- Industrial & Automation
- Military & Government
- Security

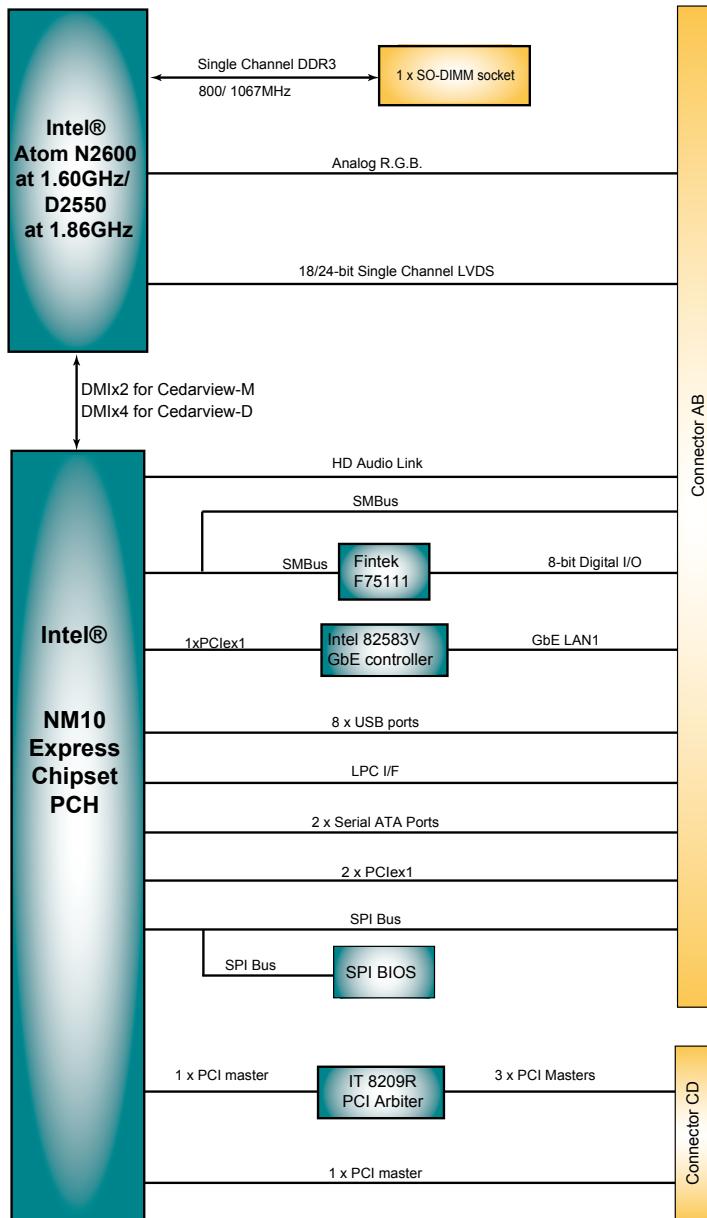
COM Express supports seven pin-out Type applying to Basic and Extended form factors:

Module Type 1 and 10 support single connector with two rows of pins (220 pins) Module Type 2, 3, 4, 5 and 6 support two connectors with four rows of pins (440 pins) Connector placement and most mounting holes have transparency between Form Factors.

The differences among the Module Type 2 and COM-652E are summarized in table below:

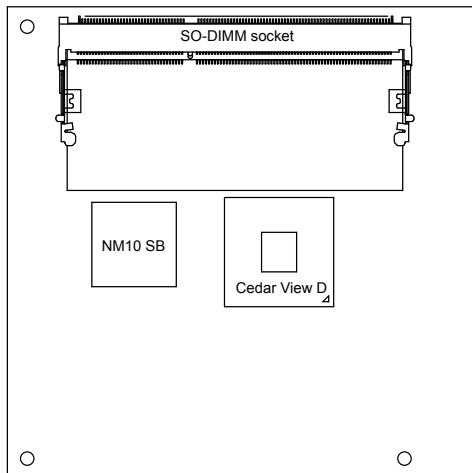
Module Type	Standard Type 2	COM-652E
Connectors	2	2
Connector Rows	A, B, C, D	A, B, C, D
PCIe Lanes (Max)	22	2
PEG (Max)	Yes	No
PCI Bus	Yes	Yes
PATA - IDE	Yes	No
Serial ATA (Max)	4	2
LAN (Max)	1	1
Serial Ports	No	No
Muxed SDVO (Max)	2	0

2.2 Block Diagram



2.3 Connectors

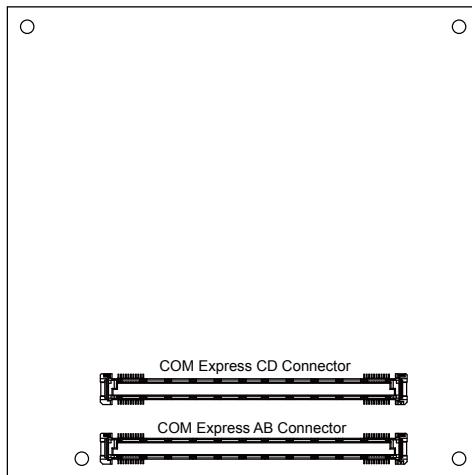
Top side



Bottom side

COM Express AB Connector

COM Express CD Connector



2.4 COM Express AB Connector (bottom side)

B1	GND	GND	A1	B56	N/C	N/C	A56
B2	GBE0_ACT#	GBE0_MDI3-	A2	B57	GND	GND	A57
B3	LPC_FRAME#	GBE0_MDI3+	A3	B58	N/C	N/C	A58
B4	LPC_ADO	GBE0_LINK100#	A4	B59	N/C	N/C	A59
B5	LPC_AD1	GBE0_LINK1000#	A5	B60	GND	GND	A60
B6	LPC_AD2	GBE0_MDI2-	A6	B61	N/C	N/C	A61
B7	LPC_AD3	GBE0_MDI2+	A7	B62	N/C	N/C	A62
B8	LPC_DRQ0#	GBE0_LINK#	A8	B63	GPO3	GPI1	A63
B9	LPC_DRQ1#	GBE0_MDI1-	A9	B64	PCIE_RX1+	PCIE_TX1+	A64
B10	LPC_CLK	GBE0_MDI1+	A10	B65	PCIE_RX1-	PCIE_TX1-	A65
B11	GND	GND	A11	B66	WAKE0#	GND	A66
B12	PWRBTN#	GBE0_MDI0-	A12	B67	WAKE1#	GPI2	A67
B13	SMB_CK	GBE0_MDI0+	A13	B68	PCIE_RX0+	PCIE_TX0+	A68
B14	SMB_DAT	GBE0_CTREF	A14	B69	PCIE_RX0-	PCIE_TX0-	A69
B15	SMB_ALERT#	SUS_S3#	A15	B70	GND	GND	A70
B16	SATA1_Tx+	SATA0_Tx+	A16	B71	N/C	LVDS_A0+	A71
B17	SATA1_Tx-	SATA0_Tx-	A17	B72	N/C	LVDS_A0-	A72
B18	SUS_STAT#	SUS_S4#	A18	B73	N/C	LVDS_A1+	A73
B19	SATA1_RX+	SATA0_RX+	A19	B74	N/C	LVDS_A1-	A74
B20	SATA1_RX-	SATA0_RX-	A20	B75	N/C	LVDS_A2+	A75
B21	GND	GND	A21	B76	N/C	LVDS_A2-	A76
B22	N/C	N/C	A22	B77	N/C	LVDS_VDD_EN	A77
B23	N/C	N/C	A23	B78	N/C	LVDS_A3+	A78
B24	PWR_OK	SUS_S5#	A24	B79	LVDS_BKLT_EN	LVDS_A3-	A79
B25	N/C	N/C	A25	B80	GND	GND	A80
B26	N/C	N/C	A26	B81	N/C	LVDS_A_CK+	A81
B27	WDT	BATLOW#	A27	B82	N/C	LVDS_A_CK-	A82
B28	AC_SDIN2	ATA_ACT#	A28	B83	CKLVDs_BKLT_CTRL	LVDS_I2C_CK	A83
B29	AC_SDIN1	AC_SYNC	A29	B84	VCC_5V_SBY	LVDS_I2C_DAT	A84
B30	AC_SDINO	AC_RST#	A30	B85	VCC_5V_SBY	GPI3	A85
B31	GND	GND	A31	B86	VCC_5V_SBY	KBD_RST#	A86
B32	SPKR	AC_BITCLK	A32	B87	VCC_5V_SBY	KBD_A20GATE	A87
B33	I2C_CK	AC_SDOUT	A33	B88	BIOS_DISABLE1#	PCIE0_CK_REF#	A88
B34	I2C_DAT	BIOS_DISABLE0#	A34	B89	VGA_RED	PCIE0_CK_REF	A89
B35	THR#	THRTRIP#	A35	B90	GND	GND	A90
B36	USB7-	USB6-	A36	B91	VGA_GRN	RSVD_B91	A91
B37	USB7+	USB6+	A37	B92	VGA_BLU	RSVD	A92
B38	USB_4_5_OC#	USB_6_7_OC#	A38	B93	VGA_HSYNC	GPO0	A93
B39	USB5-	USB4-	A39	B94	VGA_VSYNC	RSVD	A94
B40	USB5+	USB4+	A40	B95	VGA_I2C_CK	RSVD	A95
B41	GND	GND	A41	B96	VGA_I2C_DAT	GND	A96
B42	USB3-	USB2-	A42	B97	N/C	VCC_12V	A97
B43	USB3+	USB2+	A43	B98	N/C	VCC_12V	A98
B44	USB_0_1_OC#	USB_2_3_OC#	A44	B99	N/C	VCC_12V	A99
B45	USB1-	USB0-	A45	B100	GND	GND	A100
B46	USB1+	USB0+	A46	B101	VCC_12V	VCC_12V	A101
B47	EXCD1_PERST#	VCC_RTC	A47	B102	VCC_12V	VCC_12V	A102
B48	EXCD1_PPTE#	EXCD0_PERST#	A48	B103	VCC_12V	VCC_12V	A103
B49	SYS_RESET#	EXCD0_PPTE#	A49	B104	VCC_12V	VCC_12V	A104
B50	CB_RESET#	LPC_SERIRQ	A50	B105	VCC_12V	VCC_12V	A105
B51	GND	GND	A51	B106	VCC_12V	VCC_12V	A106
B52	N/C	N/C	A52	B107	VCC_12V	VCC_12V	A107
B53	N/C	N/C	A53	B108	VCC_12V	VCC_12V	A108
B54	GPO1	GPI0	A54	B109	VCC_12V	VCC_12V	A109
B55	N/C	N/C	A55	B110	GND	GND	A110

2.5 COM Express CD Connector (bottom side)

D1	GND	GND	C1	D56	N/C	N/C	C56
D2	N/C	N/C	C2	D57	TYPE2#	TYPE1#	C57
D3	N/C	N/C	C3	D58	N/C	N/C	C58
D4	N/C	N/C	C4	D59	N/C	N/C	C59
D5	N/C	N/C	C5	D60	GND	GND	C60
D6	N/C	N/C	C6	D61	N/C	N/C	C61
D7	N/C	N/C	C7	D62	N/C	N/C	C62
D8	N/C	N/C	C8	D63	RSVD	RSVD	C63
D9	N/C	N/C	C9	D64	RSVD	RSVD	C64
D10	N/C	N/C	C10	D65	N/C	N/C	C65
D11	GND	GND	C11	D66	N/C	N/C	C66
D12	N/C	N/C	C12	D67	GND	RSVD	C67
D13	N/C	N/C	C13	D68	N/C	N/C	C68
D14	N/C	N/C	C14	D69	N/C	N/C	C69
D15	N/C	PCI_PME#	C15	D70	GND	GND	C70
D16	N/C	PCI_GNT2#	C16	D71	N/C	N/C	C71
D17	N/C	PCI_REQ2#	C17	D72	N/C	N/C	C72
D18	N/C	PCI_GNT1#	C18	D73	SDVO_CLK	SDVO_DATA	C73
D19	PCI_GNT3#	PCI_REQ1#	C19	D74	N/C	N/C	C74
D20	PCI_REQ3#	PCI_GNT0#	C20	D75	N/C	N/C	C75
D21	GND	GND	C21	D76	GND	GND	C76
D22	PCI_AD1	PCI_REQ0#	C22	D77	N/C	RSVD	C77
D23	PCI_AD3	PCI_RESET#	C23	D78	N/C	N/C	C78
D24	PCI_AD5	PCI_ADO	C24	D79	N/C	N/C	C79
D25	PCI_AD7	PCI_AD2	C25	D80	GND	GND	C80
D26	PCI_C/BE0#	PCI_AD4	C26	D81	N/C	N/C	C81
D27	PCI_AD9	PCI_AD6	C27	D82	N/C	N/C	C82
D28	PCI_AD11	PCI_AD8	C28	D83	RSVD	RSVD	C83
D29	PCI_AD13	PCI_AD10	C29	D84	GND	GND	C84
D30	PCI_AD15	PCI_AD12	C30	D85	N/C	N/C	C85
D31	GND	GND	C31	D86	N/C	N/C	C86
D32	PCI_PAR	PCI_AD14	C32	D87	GND	GND	C87
D33	PCI_SERR#	PCI_C/BE1#	C33	D88	N/C	N/C	C88
D34	PCI_STOP#	PCI_PERR#	C34	D89	N/C	N/C	C89
D35	PCI_TRDY#	PCI_LOCK#	C35	D90	GND	GND	C90
D36	PCI_FRAME#	PCI_DEVSEL#	C36	D91	N/C	N/C	C91
D37	PCI_AD16	PCI_IRDY#	C37	D92	N/C	N/C	C92
D38	PCI_AD18	PCI_C/BE2#	C38	D93	GND	GND	C93
D39	PCI_AD20	PCI_AD17	C39	D94	N/C	N/C	C94
D40	PCI_AD22	PCI_AD19	C40	D95	N/C	N/C	C95
D41	GND	GND	C41	D96	GND	GND	C96
D42	PCI_AD24	PCI_AD21	C42	D97	N/C	RSVD	C97
D43	PCI_AD26	PCI_AD23	C43	D98	N/C	N/C	C98
D44	PCI_AD28	PCI_C/BE3#	C44	D99	N/C	N/C	C99
D45	PCI_AD30	PCI_AD25	C45	D100	GND	GND	C100
D46	PCI IRQC#	PCI_AD27	C46	D101	N/C	N/C	C101
D47	PCI IRQD#	PCI_AD29	C47	D102	N/C	N/C	C102
D48	PCI_CLKRUN#	PCI_AD31	C48	D103	GND	GND	C103
D49	PCI_M66EN	PCI IRQA#	C49	D104	VCC_12V	VCC_12V	C104
D50	PCI_CLK	PCI IRQB#	C50	D105	VCC_12V	VCC_12V	C105
D51	GND	GND (FIXED)	C51	D106	VCC_12V	VCC_12V	C106
D52	N/C	N/C	C52	D107	VCC_12V	VCC_12V	C107
D53	N/C	N/C	C53	D108	VCC_12V	VCC_12V	C108
D54	N/C	TYPE0#	C54	D109	VCC_12V	VCC_12V	C109
D55	N/C	N/C	C55	D110	GND	GND	C110

2.6 The Installation Paths of CD Driver

Windows 7

Driver	Path
Chipset	\EmETXe-i250x\CHIPSET\WIN7
LAN	\EmETXe-i250x\ETHERNET
VGA	\EmETXe-i250x\GRAPHICS
Audio	\EmETXe-i250x\AUDIO



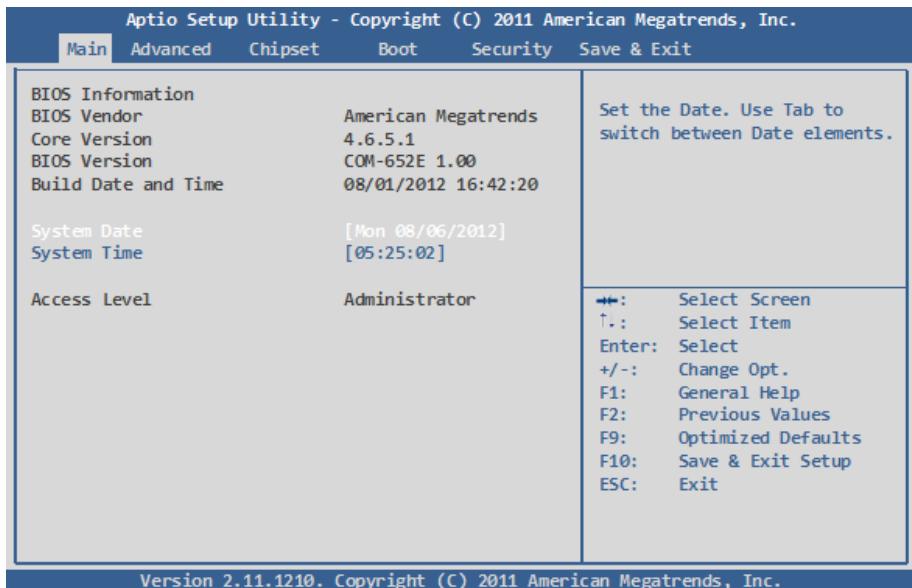
Chapter 3

BIOS

3.1 BIOS Main Setup

The AMI BIOS provides a setup utility program for specifying the system configurations and settings which are stored in the BIOS ROM of the system. When you turn on the computer, the AMI BIOS is immediately activated. After you have entered the setup utility, use the left/right arrow keys to highlight a particular configuration screen from the top menu bar or use the down arrow key to access and configure the information below.

NOTE: In order to increase system stability and performance, our engineering staff are constantly improving the BIOS menu. The BIOS setup screens and descriptions illustrated in this manual are for your reference only, and may not completely match what you see on your screen.



BIOS Information

Display the BIOS information.

System Date

Set the system date. Note that the 'Day' automatically changes when you set the date.

The date format is:

Day : Sun to Sat

Month : 1 to 12

Date : 1 to 31

Year : 1999 to 2099

System Time

Set the system time.

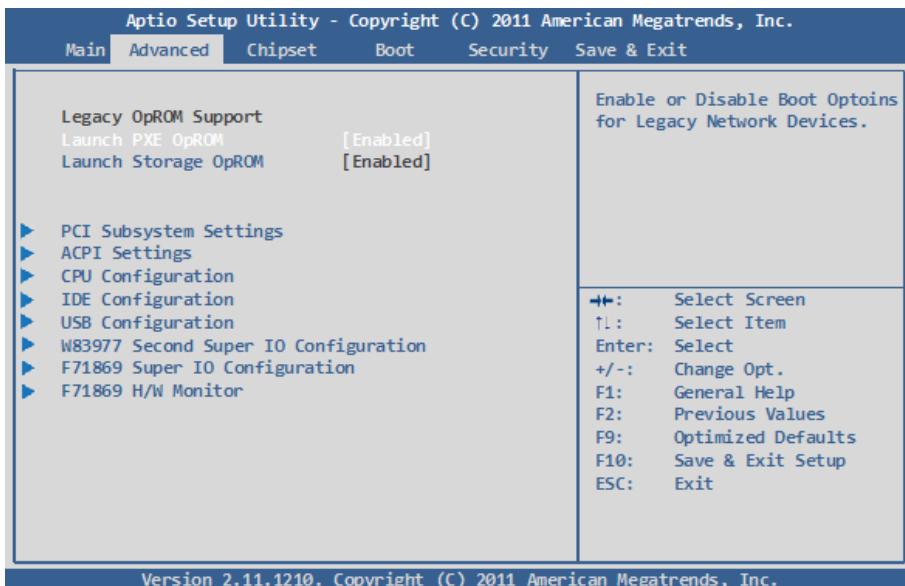
The time format is:

Hour : 00 to 23

Minute : 00 to 59

Second : 00 to 59

3.2 Advanced Settings



Legacy OpROM Support

Launch PXE OpROM

Enable or disable the boot option for legacy network devices.

Launch Storage OpROM

Enable or Disable Boot Option for Legacy Mass Storage Devices with Option ROM.

3.2.1 PCI Subsystem Settings

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
PCI Bus Driver Version	V 2.05.01				
PCI Option ROM Handling					In case of multiple Option ROMs (Legacy and EFI Compatible), specifies what PCI Option ROM to launch.
PCI ROM Priority	[EFI Compatible ROM]				
PCI Common Settings					
PCI Latency Timer	[32 PCI Bus Clocks]				
VGA Palette Snoop	[Disabled]				
PERR# Generation	[Disabled]				
SERR# Generation	[Disabled]				
↺: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit Setup ESC: Exit					

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PCI ROM Priority

In case of multiple Option ROMs (Legacy and EFI Compatible), specifies what PCI Option ROM to launch.

PCI Latency Timer

Value to be programmed into PCI Latency Timer Register.

VGA Palette Snoop

Enables or Disabled VGA Palette Registers Snooping.

PERR# Generation

Enables or Disabled PCI Device to Generate PERR#.

SERR# Generation

Enables or Disabled PCI Device to Generate SERR#.

3.2.2 ACPI Settings

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
ACPI Settings	Enables or Disables BIOS ACPI Auto Configuration.
Enable ACPI Auto Configuration [Disabled]	
Enable Hibernation	[32 PCI Bus Clocks]
ACPI Sleep State	[S1 (CPU Stop Clock)]
LOCK Legacy Resources	[Disabled]
Power-Supply Type	[ATX]
	<p>→ : Select Screen ↑↓ : Select Item Enter: Select +/ -: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit Setup ESC: Exit</p>

Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

Enable ACPI Auto Configuration

Enables or disables BIOS ACPI Auto Configuration.

Enable Hibernation

Enable or disable System ability to Hibernation (OS/S4 Sleep State). This option may be not effective with some OS.

ACPI Sleep State

Select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

The choice: Suspend Disabled, S1 (CPU Stop Clock), S3 (Suspend to RAM)

Lock Legacy Resources

Enables or disables Lock of Legacy Resources.

Power-Supply Type

Set power-supply type.

The choice: AT, ATX

3.2.3 CPU Configuration

The CPU Configuration setup screen varies depending on the installed processor.

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.		
Advanced		
CPU Configuration		
Processor Type	Intel(R) Atom(TM) CPU Supported	Enabled for Windows XP and Linux (OS optimized for Hyper-Threading Technology) and Disabled for other OS (OS not optimized for Hyper-Threading Technology).
EMT64		
Processor Speed	1865 MHz	
System Bus Speed	533 MHz	
Ratio Status	14	
Actual Ratio	14	
System Bus Speed	533 MHz	
Processor Stepping	30611	↑↓ : Select Screen
Microcode Revision	269	↑↓ : Select Item
L1 Cache RAM	2x56 k	Enter: Select
L2 Cache RAM	2x512 k	+/- : Change Opt.
Processor Core	Dual	F1: General Help
Hyper-Threading	Supported	F2: Previous Values
Hyper-Threading	[Enabled]	F9: Optimized Defaults
Execute Disable Bit	[Enabled]	F10: Save & Exit Setup
Limit CPUID Maximum	[Disabled]	ESC: Exit

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Hyper-threading

This item is used to enable or disable the processor's Hyper-threading feature.

Enabled for Windows XP and Linux (OS optimized for Hyper-threading Technology) and disabled for other OS (OS not optimized for Hyper-threading Technology).

When disabled, only one thread per enabled core is enabled.

Execute Disable Bit

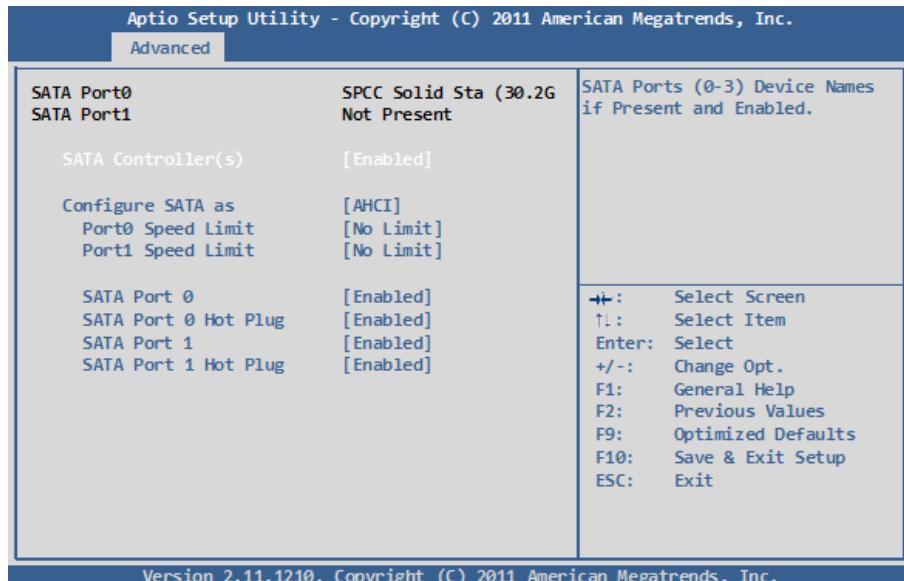
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, RedHat Enterprise 3, update 3.)

Limit CPUID Maximum

Disabled for Windows XP.

3.2.4 IDE Configuration

It allows you to select the operation mode for SATA controller.



SATA Controller(s)

Enable or disable SATA devices.

SATA Mode Selection

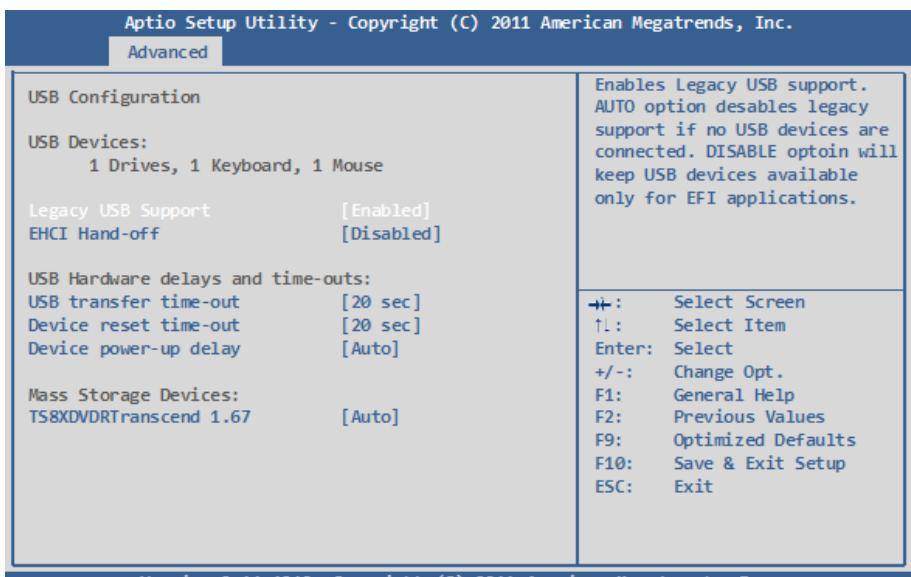
The choice: Disable; IDE (Default), AHCI (not available in EmETXe-i65M2), RAID

IDE: Set the Serial ATA drives as Parallel ATA storage devices.

AHCI: Allow the Serial ATA devices to use AHCI (Advanced Host Controller Interface).

RAID: Create RAID or Intel Matrix Storage configuration on Serial ATA devices.

3.2.5 USB Configuration



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Legacy USB Support

Enable support for legacy USB. AUTO option disables legacy support if no USB devices are connected.

The choice: Enabled (Default); Auto; Disabled

EHCI Hand-off

Allow you to enable support for operating systems without an EHCI hand-off feature. Do not disable the BIOS EHCI Hand-Off option if you are running a Windows® operating system with USB device.

The choice: Enabled (Default); Disabled

USB transfer time-out

The time-out value for Control, Bulk, and Interrupt transfers. Default setting: 20 sec

Device reset time-out

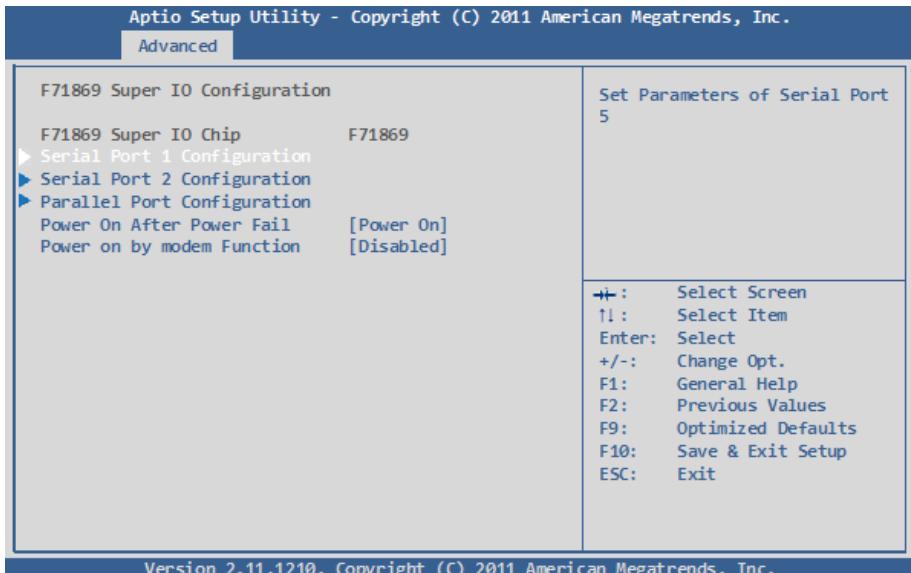
USB mass storage device Start Unit command time-out. Default setting: 20 sec

Device power-up delay

Maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a Root port it is 100ms, for a Hub port the delay is taken from hub descriptor. The choice: Auto (Default); Manual

3.2.6 Super IO Configuration

You can use this item to set up or change the Super IO configuration for parallel ports and serial ports.



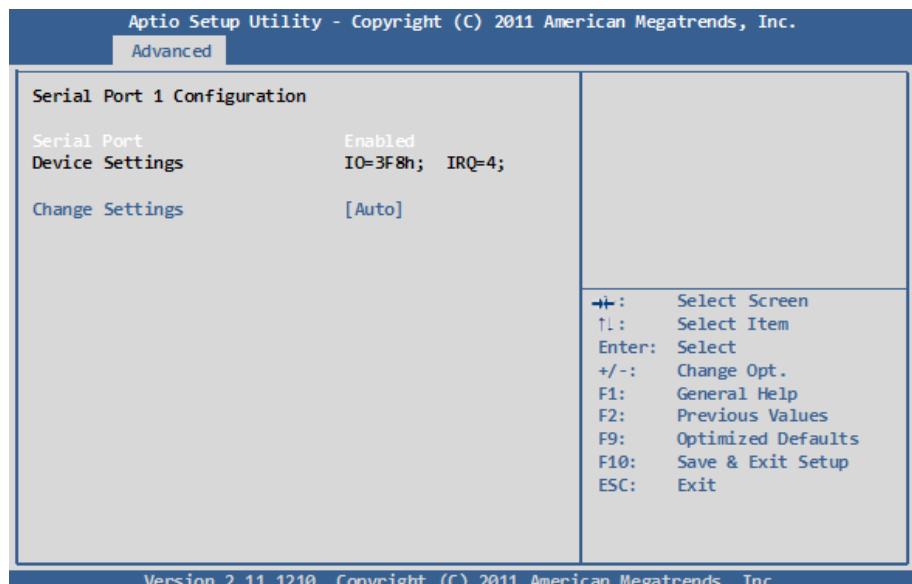
Power On After Power Failure

Specify what state to go to when power is re-applied after a power failure.

Power On by modem Function

Enables or Disables the Power On by modem fuction.

Serial Port 1~2 Configuration



Serial Port

Use the Serial port option to enable or disable the serial port.

The choice: Enabled, Disabled

Change Settings

Use the Change Settings option to change the serial port's IO port address and interrupt address.

The choice:

Auto

IO=3F8h; IRQ=4,

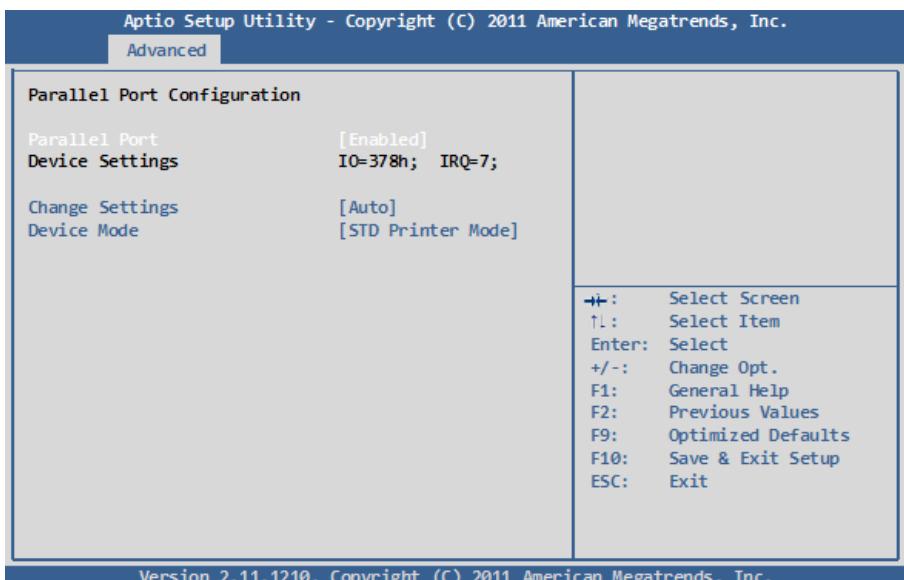
IO=3F8h; IRQ=3,4,5,6,7,10,11,12

IO=2F8h; IRQ=3,4,5,6,7,10,11,12

IO=3E8h; IRQ=3,4,5,6,7,10,11,12

IO=2E8h; IRQ=3,4,5,6,7,10,11,12

Parallel Port Configuration



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Parallel Port Configuration

This item allows you to enable/disable Parallel Port (LPT/LPTE).

Change Settings

Use the Change Settings option to change the parallel port's IO port address and interrupt address.

The choice:

Auto

IO=378h; IRQ=5,

IO=378h; IRO=5,6,7,10,11,12,

IO=378h; IRQ=5,6,7,10,11,12,

IO=278h; IRQ=5,6,7,10,11,12,

IO=38Ch; IRQ=5,6,7,10,11,12,

Device Mode

The choice: Standard Parallel Port Mode, EPP Mode, ECP Mode, EPP Mode & ECP Mode.

3.2.7 F71869 H/W Monitor

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.	
Advanced	
PC Health Status System Temperature : +34 C CPU Temperature : +44 C CPUF1 Speed : N/A SVSF1 Speed : N/A VCORE : +1.202 V 5V : +5.046 V 1.05V : +1.052 V VCC3V : +3.344 V +1.5V : +1.520 V +12V : +11.968 V +3.3V : +3.344 V VSB3 : +3.344 V VBAT : +3.264 V	→ : Select Screen ↓ : Select Item Enter: Select +/- : Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit Setup ESC: Exit

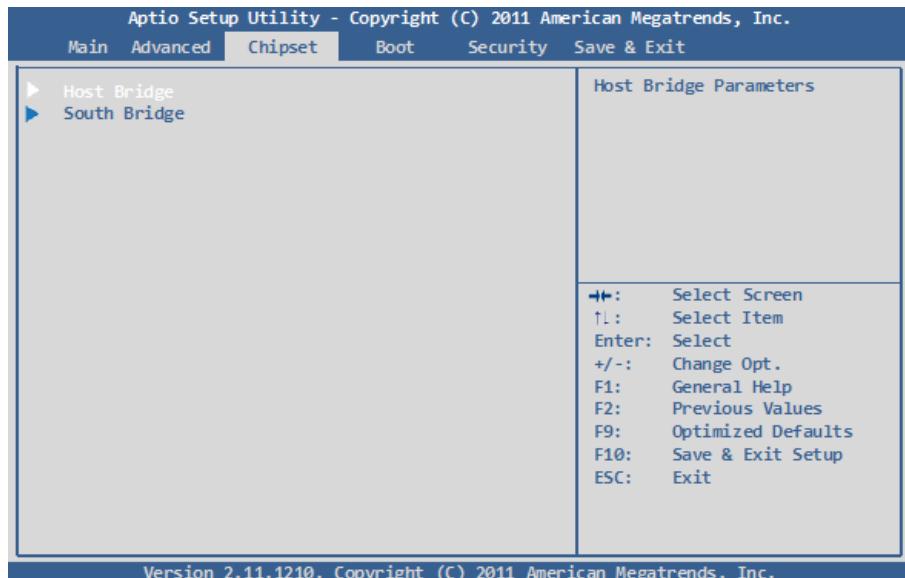
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.

PC Health Status

The hardware monitor menu shows the operating temperature and system voltages of CPU module.

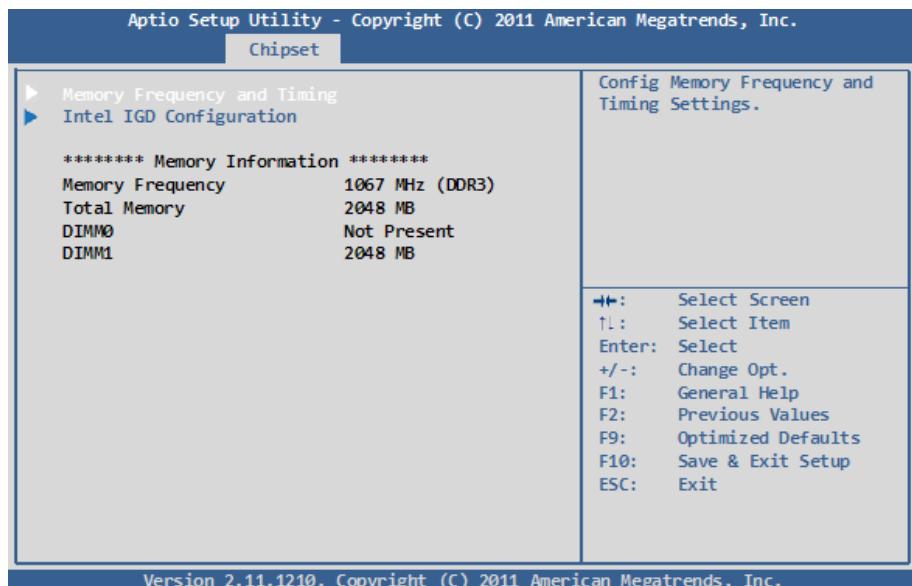
3.3 Chipset

This section allows you to configure and improve your system; also, set up some system features according to your preference.

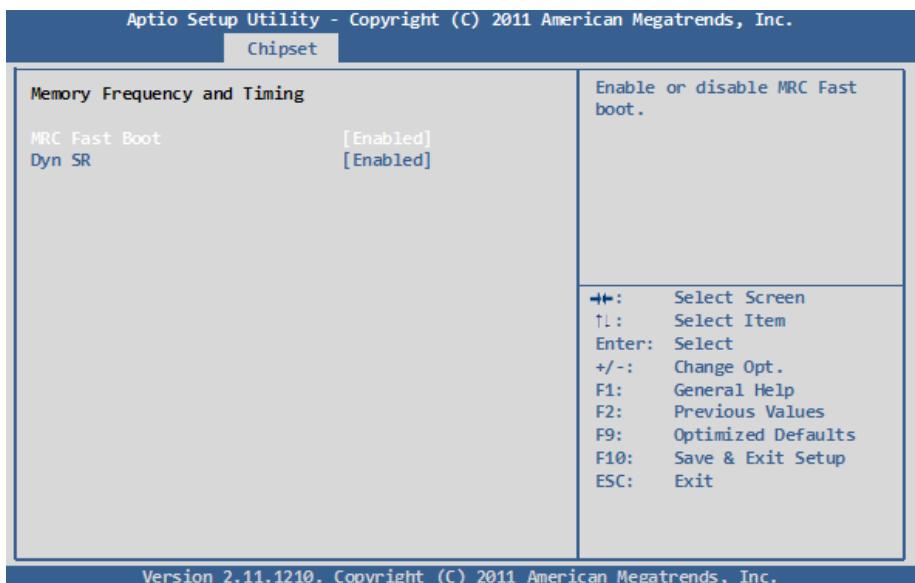


3.3.1 Host Bridge Parameters

Memory Frequency and Timing



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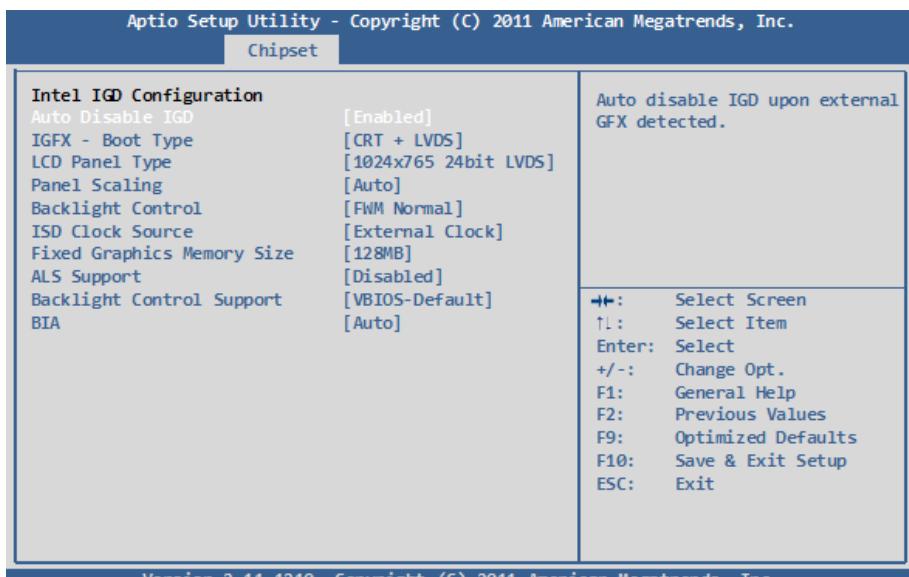
MRC Fast Boot

Enable or disable MRC fast boot.

Dyn SR

Enable or disable Dyn SR.

Intel IGD Configuration



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Auto Disable IGD

Auto disable IGD upon external GFX detected.

IGFX - Boot Type

Select the Video Device which will be activated during POST. This has no effect if external graphics present.

LCD Panel Type

Select LCD panel used by Internal Graphics Device by selecting the appropriate setup item: VBIOS Default, 640x480 LVDS ~ 2048x1536 LVDS.

Panel Scaling

Select the LCD panel scaling option used by the Internal Graphics Device: Auto, Off, Force Scaling.

Backlight Control

The choice: PWM Inverted (Default), PWM Normal, GMBus Inverted and GM-Bus Normal.

ISD Clock Source

ISD clock selection.

Fixed Graphics Memory Size

Configure fixed Graphics memory size.

ALS Support

The choice: Enabled, Disabled.

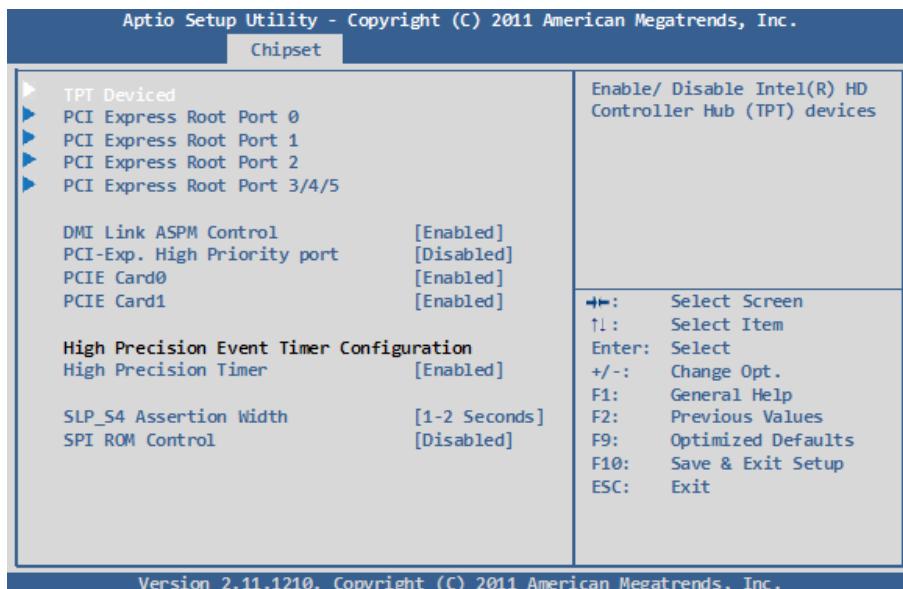
Backlight Control Support

Backlight control configuration.

BIA

The choice: VBIOS Default, Disabled and Level 1/2/3/4/5.

3.3.2 SB Configuration



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DMI Link ASPM Control

The control of Active State Power Management on both NB side and SB side of the DMI Link.

PCI-Exp. High Priority port

Enables or Disables PCI-Exp. High Priority port.

PCIE Card0/1

Enables or Disables PCIE Card0/1.

High Precision Timer

Enables or Disables High Precision Timer.

SLP_S4 Assertion Width

Select a minimum assertion width of the SLP_S4# signal.

The choice: 1-2 Seconds, 2-3 Seconds, 3-4 Seconds, 4-5 Seconds

SPI ROM Control

Enables or Disables SPI ROM Control.

Select USB Mode

Select USB mode to control USB port.

UHCI1~4

Control the USB UHCI (USB 1.1) functions. Disable from highest to lowest controller.

USB 2.0 (EHCI) Support

Enable or Disable USB 2.0 (EHCI).

LAN controller

Enable or Disable OnChip NIC Controller.

SMBus controller

Enable or Disable SMBus controller.

SIRQ Logic

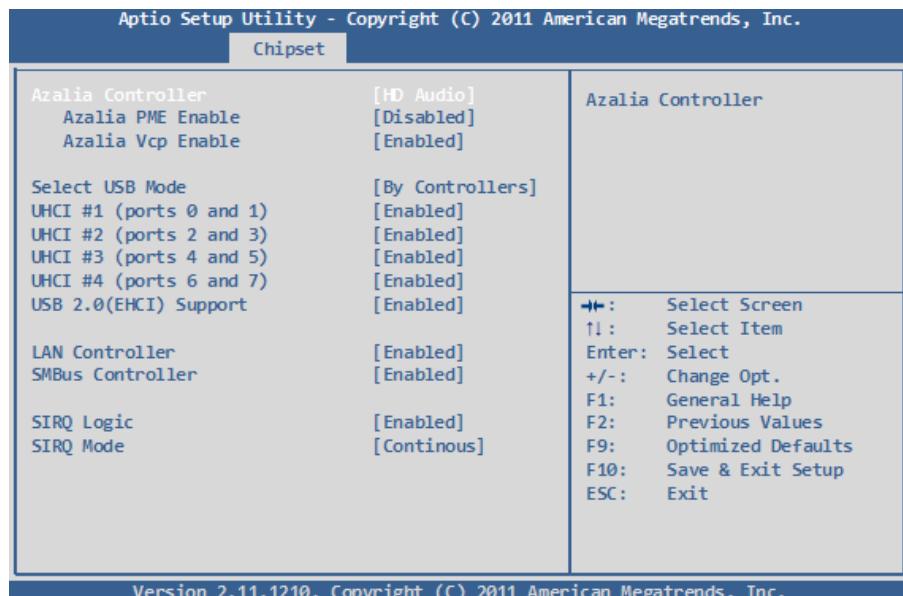
Enable or Disable SIRQ logic.

SIRQ Mode

SIRQ Mode selection.

TPT Deviced

Enable/ Disable Intel(R) IO Controller Hub (TPT) devices.



Azalia Controller

Control detection of the Azalia device.

Disabled = Azalia will be unconditionally disabled.

AH Audio = Azalia will be enabled if present, disabled otherwise.

Azalia PME Enable

Enable or Disable Power Management capability of Audio Controller.

Azalia Vcp Enable

Azalia supports 1 external VC, which, when enabled, overrides ICH VCp settings.

PCI Express Root Port 0~5

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.	
Chipset	
PCI Express Port 0	[Enabled]
Port 0 IDxAPIC	[Disabled]
Automatic ASPM	[Manual]
ASPM LOS	[Disabled]
ASPM L1	[Disabled]
URR	[Disabled]
FER	[Disabled]
NFER	[Disabled]
CER	[Disabled]
CTO	[Disabled]
SEFE	[Disabled]
SENFE	[Disabled]
SECE	[Disabled]
PME SCI	[Enabled]
Hot Plug	[Disabled]
Enable/ Disable PCI Express Root Port 0.	
←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit Setup ESC: Exit	

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PCI Express Root Port 0~5

Control the PCI Express Root Port.

ASPM Support

Set the ASPM Level to Disabled, L0s, L1, L0sL1, Auto

Force L0 - Force all links to L0 State

AUTO - BIOS auto configuration

DISABLE - Disable ASPM

URR

Enable or disable PCI Express Unsupported Request Reporting.

FER

Enable or disable PCI Express Device Fatal Error Reporting.

NFER

Enable or disable PCI Express Device Non-Fatal Error Reporting.

CER

Enable or disable PCI Express Device Correctable Error Reporting.

CTO

Enable or disable PCI Express Completion Timer TO.

SEFE

Enable or disable Root PCI Express System Error on Fatal Error.

SENFE

Enable or disable Root PCI Express System Error on Non-Fatal Error.

SECE

Enable or disable Root PCI Express System Error on Correctable Error.

PME SCI

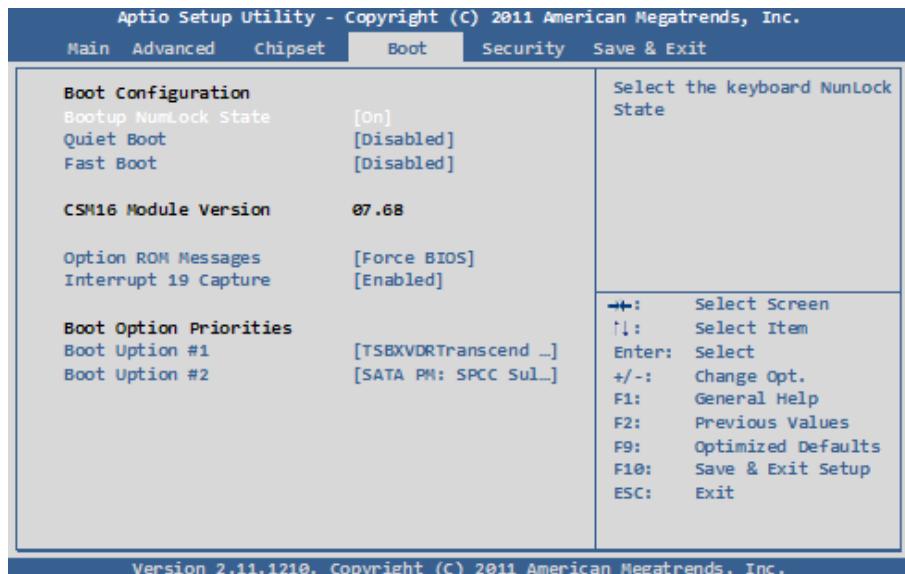
Enable or disable PCI Express PME SCI.

Hot Plug

Enable or disable PCI Express Hot Plug.

3.4 Boot Settings

The Boot menu items allow you to change the system boot options.



Boot Configuration

Bootup NumLock State

This setting determines whether the Num Lock key should be activated at boot up.

Quiet Boot

This allows you to select the screen display when the system boots.

Fast Boot

Enables or disables boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot option.

Option ROM Messegges

Set display mode for Option ROM.

Interrupt 19 Capture

Enabled: Allows option ROM to trap Int 19.

Boot Option Priorities

Select the boot sequence of the hard drives.

3.5 Security

Aptio Setup Utility - Copyright (C) 2011 American Megatrends, Inc.					
Main	Advanced	Chipset	Boot	Security	Save & Exit
Password Description If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup. If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights. The password length must be in the following range: Minimum length 3 Maximum length 20 Administrator Password User Password HDD Security Configuration: HDD 0: ST3500630AS				Set Administrator Password Legend: ←→: Select Screen ↑↓: Select Item Enter: Select +/-: Change Opt. F1: General Help F2: Previous Values F9: Optimized Defaults F10: Save & Exit Setup ESC: Exit	
Version 2.11.1210. Copyright (C) 2011 American Megatrends, Inc.					

Administrator Password

Use the Administrator Password to set or change a administrator password.

ENTER PASSWORD

Type the password, up to eight characters in length, and press <Enter>. The password typed now will clear any previously entered password from CMOS memory. You will be asked to confirm the password. Type the password again and press <Enter>. You may also press <ESC> to abort the selection and not enter a password.

To disable a password, just press <Enter> when you are prompted to enter the password. A message will confirm the password will be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

PASSWORD DISABLED

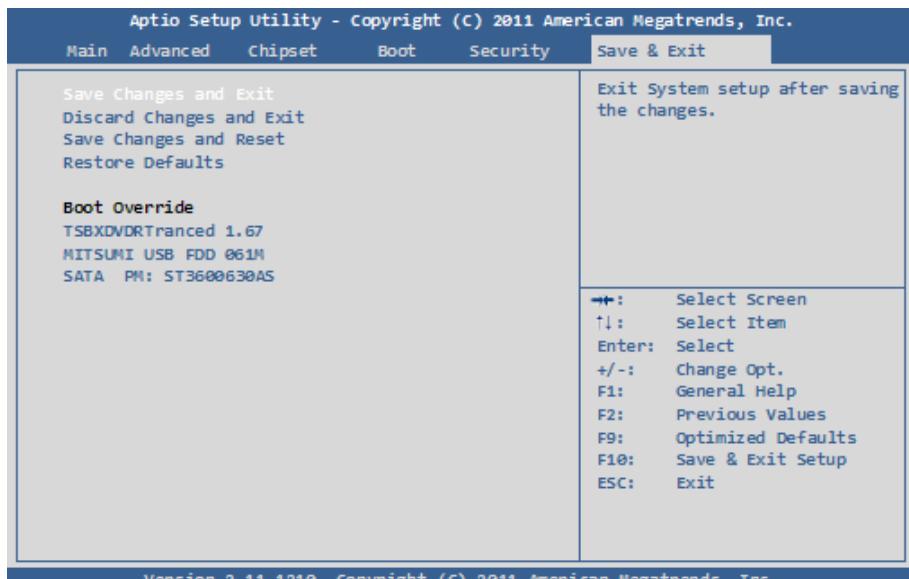
When a password has been enabled, you will be prompted to enter it every time you try to enter Setup. This prevents an unauthorized person from

changing any part of your system configuration.

Additionally, when a password is enabled, you can also require the BIOS to request a password every time your system is rebooted. This would prevent unauthorized use of your computer.

You can determine when the password is required within the BIOS Features Setup Menu and its Security option. If the Security option is set to “System”, the password will be required both at boot and at entry to Setup. If it's set to “Setup”, prompting only occurs when trying to enter Setup.

3.6 Save & Exit



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Save Changes and Reset

Pressing <Enter> on this item and it asks for confirmation:

Save configuration changes and exit setup?

Pressing <OK> stores the selection made in the menus in CMOS - a special section of memory that stays on after you turn your system off. The next time you boot your computer, the BIOS configures your system according to the Setup selections stored in CMOS. After saving the values the system is restarted again.

Restore Defaults

Restore system to factory default.

Pressing <Enter> on this item and it asks for confirmation prior to executing this command.

Boot Override

This group of functions includes a list of tokens, each of them corresponding to one device within the boot order. Select a drive to immediately boot that device regardless of the current boot order.

3.7 AMI BIOS Checkpoints

3.7.1 Checkpoint Ranges

Status Code Range	Description
0x01 – 0x0B	SEC execution
0x0C – 0x0F	SEC errors
0x10 – 0x2F	PEI execution up to and including memory detection
0x30 – 0x4F	PEI execution after memory detection
0x50 – 0x5F	PEI errors
0x60 – 0x8F	DXE execution up to BDS
0x90 – 0xCF	BDS execution
0xD0 – 0xDF	DXE errors
0xE0 – 0xE8	S3 Resume (PEI)
0xE9 – 0xEF	S3 Resume errors (PEI)
0xF0 – 0xF8	Recovery (PEI)
0xF9 – 0xFF	Recovery errors (PEI)

3.7.2 Standard Checkpoints

SEC Phase

Status Code	Description
0x00	Not used
Progress Codes	
0x01	Power on. Reset type detection (soft/hard).
0x02	AP initialization before microcode loading
0x03	North Bridge initialization before microcode loading
0x04	South Bridge initialization before microcode loading
0x05	OEM initialization before microcode loading
0x06	Microcode loading
0x07	AP initialization after microcode loading
0x08	North Bridge initialization after microcode loading
0x09	South Bridge initialization after microcode loading
0x0A	OEM initialization after microcode loading
0x0B	Cache initialization
SEC Error Codes	
0x0C – 0x0D	Reserved for future AMI SEC error codes
0x0E	Microcode not found
0x0F	Microcode not loaded

PEI Phase

Status Code	Description
Progress Codes	
0x10	PEI Core is started
0x11	Pre-memory CPU initialization is started
0x12	Pre-memory CPU initialization (CPU module specific)
0x13	Pre-memory CPU initialization (CPU module specific)
0x14	Pre-memory CPU initialization (CPU module specific)
0x15	Pre-memory North Bridge initialization is started
0x16	Pre-Memory North Bridge initialization (North Bridge module specific)
0x17	Pre-Memory North Bridge initialization (North Bridge module specific)
0x18	Pre-Memory North Bridge initialization (North Bridge module specific)
0x19	Pre-memory South Bridge initialization is started
0x1A	Pre-memory South Bridge initialization (South Bridge module specific)
0x1B	Pre-memory South Bridge initialization (South Bridge module specific)
0x1C	Pre-memory South Bridge initialization (South Bridge module specific)
0x1D – 0x2A	OEM pre-memory initialization codes
0x2B	Memory initialization. Serial Presence Detect (SPD) data reading
0x2C	Memory initialization. Memory presence detection
0x2D	Memory initialization. Programming memory timing information
0x2E	Memory initialization. Configuring memory
0x2F	Memory initialization (other).
0x30	Reserved for ASL (see ASL Status Codes section below)
0x31	Memory Installed

0x32	CPU post-memory initialization is started
0x33	CPU post-memory initialization. Cache initialization
0x34	CPU post-memory initialization. Application Processor(s) (AP) initialization
0x35	CPU post-memory initialization. Boot Strap Processor (BSP) selection
0x36	CPU post-memory initialization. System Management Mode (SMM) initialization
0x37	Post-Memory North Bridge initialization is started
0x38	Post-Memory North Bridge initialization (North Bridge module specific)
0x39	Post-Memory North Bridge initialization (North Bridge module specific)
0x3A	Post-Memory North Bridge initialization (North Bridge module specific)
0x3B	Post-Memory South Bridge initialization is started
0x3C	Post-Memory South Bridge initialization (South Bridge module specific)
0x3D	Post-Memory South Bridge initialization (South Bridge module specific)
0x3E	Post-Memory South Bridge initialization (South Bridge module specific)
0x3F-0x4E	OEM post memory initialization codes
0x4F	DXE IPL is started

PEI Error Codes

0x50	Memory initialization error. Invalid memory type or incompatible memory speed
0x51	Memory initialization error. SPD reading has failed
0x52	Memory initialization error. Invalid memory size or memory modules do not match.
0x53	Memory initialization error. No usable memory detected
0x54	Unspecified memory initialization error.

0x55	Memory not installed
0x56	Invalid CPU type or Speed
0x57	CPU mismatch
0x58	CPU self test failed or possible CPU cache error
0x59	CPU micro-code is not found or micro-code update is failed
0x5A	Internal CPU error
0x5B	reset PPI is not available
0x5C-0x5F	Reserved for future AMI error codes

S3 Resume Progress Codes

0xE0	S3 Resume is started (S3 Resume PPI is called by the DXE IPL)
0xE1	S3 Boot Script execution
0xE2	Video repost
0xE3	OS S3 wake vector call
0xE4-0xEF	Reserved for future AMI progress codes

S3 Resume Error Codes

0xE8	S3 Resume Failed
0xE9	S3 Resume PPI not Found
0xEA	S3 Resume Boot Script Error
0xEB	S3 OS Wake Error
0xEC-0xEF	Reserved for future AMI error codes

Recovery Progress Codes

0xF0	Recovery condition triggered by firmware (Auto recovery)
0xF1	Recovery condition triggered by user (Forced recovery)
0xF2	Recovery process started
0xF3	Recovery firmware image is found
0xF4	Recovery firmware image is loaded
0xF5-0xF7	Reserved for future AMI progress codes

Recovery Error Codes

0xF8	Recovery PPI is not available
------	-------------------------------

0xF9	Recovery capsule is not found
0xFA	Invalid recovery capsule
0xFB – 0xFF	Reserved for future AMI error codes

DXE Phase

Status Code	Description
0x60	DXE Core is started
0x61	NVRAM initialization
0x62	Installation of the South Bridge Runtime Services
0x63	CPU DXE initialization is started
0x64	CPU DXE initialization (CPU module specific)
0x65	CPU DXE initialization (CPU module specific)
0x66	CPU DXE initialization (CPU module specific)
0x67	CPU DXE initialization (CPU module specific)
0x68	PCI host bridge initialization
0x69	North Bridge DXE initialization is started
0x6A	North Bridge DXE SMM initialization is started
0x6B	North Bridge DXE initialization (North Bridge module specific)
0x6C	North Bridge DXE initialization (North Bridge module specific)
0x6D	North Bridge DXE initialization (North Bridge module specific)
0x6E	North Bridge DXE initialization (North Bridge module specific)
0x6F	North Bridge DXE initialization (North Bridge module specific)
0x70	South Bridge DXE initialization is started
0x71	South Bridge DXE SMM initialization is started
0x72	South Bridge devices initialization
0x73	South Bridge DXE Initialization (South Bridge module specific)

0x74	South Bridge DXE Initialization (South Bridge module specific)
0x75	South Bridge DXE Initialization (South Bridge module specific)
0x76	South Bridge DXE Initialization (South Bridge module specific)
0x77	South Bridge DXE Initialization (South Bridge module specific)
0x78	ACPI module initialization
0x79	CSM initialization
0x7A – 0x7F	Reserved for future AMI DXE codes
0x80 – 0x8F	OEM DXE initialization codes
0x90	Boot Device Selection (BDS) phase is started
0x91	Driver connecting is started
0x92	PCI Bus initialization is started
0x93	PCI Bus Hot Plug Controller Initialization
0x94	PCI Bus Enumeration
0x95	PCI Bus Request Resources
0x96	PCI Bus Assign Resources
0x97	Console Output devices connect
0x98	Console input devices connect
0x99	Super IO Initialization
0x9A	USB initialization is started
0x9B	USB Reset
0x9C	USB Detect
0x9D	USB Enable
0x9E – 0x9F	Reserved for future AMI codes
0xA0	IDE initialization is started
0xA1	IDE Reset
0xA2	IDE Detect
0xA3	IDE Enable

0xA4	SCSI initialization is started
0xA5	SCSI Reset
0xA6	SCSI Detect
0xA7	SCSI Enable
0xA8	Setup Verifying Password
0xA9	Start of Setup
0xAA	Reserved for ASL (see ASL Status Codes section below)
0xAB	Setup Input Wait
0xAC	Reserved for ASL (see ASL Status Codes section below)
0xAD	Ready To Boot event
0xAE	Legacy Boot event
0xAF	Exit Boot Services event
0xB0	Runtime Set Virtual Address MAP Begin
0xB1	Runtime Set Virtual Address MAP End
0xB2	Legacy Option ROM Initialization
0xB3	System Reset
0xB4	USB hot plug
0xB5	PCI bus hot plug
0xB6	Clean-up of NVRAM
0xB7	Configuration Reset (reset of NVRAM settings)
0xB8 – 0xBF	Reserved for future AMI codes
0xC0 – 0xCF	OEM BDS initialization codes

DXE Error Codes

0xD0	CPU initialization error
0xD1	North Bridge initialization error
0xD2	South Bridge initialization error
0xD3	Some of the Architectural Protocols are not available
0xD4	PCI resource allocation error. Out of Resources
0xD5	No Space for Legacy Option ROM
0xD6	No Console Output Devices are found

0xD7	No Console Input Devices are found
0xD8	Invalid password
0xD9	Error loading Boot Option (LoadImage returned error)
0xDA	Boot Option is failed (StartImage returned error)
0xDB	Flash update is failed
0xDC	Reset protocol is not available

ACPI/ASL Checkpoints

Status Code	Description
0x01	System is entering S1 sleep state
0x02	System is entering S2 sleep state
0x03	System is entering S3 sleep state
0x04	System is entering S4 sleep state
0x05	System is entering S5 sleep state
0x10	System is waking up from the S1 sleep state
0x20	System is waking up from the S2 sleep state
0x30	System is waking up from the S3 sleep state
0x40	System is waking up from the S4 sleep state
0xAC	System has transitioned into ACPI mode. Interrupt controller is in PIC mode.
0xAA	System has transitioned into ACPI mode. Interrupt controller is in APIC mode.

Appendix

Appendix A: I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device.

The following table lists the I/O port addresses used.

Address	Device Description
0x00000000-0x00000CF7	PCI bus
0x00000000-0x00000CF7	Direct memory access controller
0x00000D00-0x0000FFFF	PCI bus
0x0000F000-0x0000F03F	Video Controller (VGA Compatible)
0x0000F060-0x0000F07F	Ethernet Controller
0x00000A79-0x00000A79	ISAPNP Read Data Port
0x00000279-0x00000279	ISAPNP Read Data Port
0x00000274-0x00000277	ISAPNP Read Data Port
0x00000081-0x00000091	Direct memory access controller
0x00000093-0x0000009F	Direct memory access controller
0x000000C0-0x000000DF	Direct memory access controller
0x00000020-0x00000021	Programmable interrupt controller
0x00000024-0x00000025	Programmable interrupt controller
0x00000028-0x00000029	Programmable interrupt controller
0x0000002C-0x0000002D	Programmable interrupt controller
0x00000030-0x00000031	Programmable interrupt controller
0x00000034-0x00000035	Programmable interrupt controller
0x00000038-0x00000039	Programmable interrupt controller
0x0000003C-0x0000003D	Programmable interrupt controller
0x000000A0-0x000000A1	Programmable interrupt controller
0x000000A4-0x000000A5	Programmable interrupt controller
0x000000A8-0x000000A9	Programmable interrupt controller
0x000000AC-0x000000AD	Programmable interrupt controller
0x000000B0-0x000000B1	Programmable interrupt controller
0x000000B4-0x000000B5	Programmable interrupt controller
0x000000B8-0x000000B9	Programmable interrupt controller

0x000000BC-0x000000BD	Programmable interrupt controller
0x000004D0-0x000004D1	Programmable interrupt controller
0x000004D0-0x000004D1	Motherboard resources
0x0000002E-0x0000002F	Motherboard resources
0x0000004E-0x0000004F	Motherboard resources
0x00000061-0x00000061	Motherboard resources
0x00000063-0x00000063	Motherboard resources
0x00000065-0x00000065	Motherboard resources
0x00000067-0x00000067	Motherboard resources
0x00000070-0x00000070	Motherboard resources
0x00000070-0x00000070	System CMOS/real time clock
0x00000080-0x00000080	Motherboard resources
0x00000080-0x00000080	Motherboard resources
0x00000092-0x00000092	Motherboard resources
0x000000B2-0x000000B3	Motherboard resources
0x00000680-0x0000069F	Motherboard resources
0x00001000-0x0000100F	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x0000FFFF-0x0000FFFF	Motherboard resources
0x00000400-0x00000453	Motherboard resources
0x00000458-0x0000047F	Motherboard resources
0x00000500-0x0000057F	Motherboard resources
0x0000164E-0x0000164F	Motherboard resources
0x00000040-0x00000043	System timer
0x00000050-0x00000053	System timer
0x00000454-0x00000457	Motherboard resources
0x00000A00-0x00000A1F	Motherboard resources
0x00000290-0x0000029F	Motherboard resources
0x00000060-0x00000060	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard

0x00000064-0x00000064	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
0x0000003F8-0x000003FF	Communications Port (COM1)
0x0000002F8-0x000002FF	Communications Port (COM2)
0x000000378-0x0000037F	Printer Port (LPT1)
0x00000010-0x0000001F	Motherboard resources
0x00000022-0x0000003F	Motherboard resources
0x00000044-0x0000005F	Motherboard resources
0x00000072-0x0000007F	Motherboard resources
0x00000084-0x00000086	Motherboard resources
0x00000088-0x00000088	Motherboard resources
0x0000008C-0x0000008E	Motherboard resources
0x00000090-0x0000009F	Motherboard resources
0x000000A2-0x000000BF	Motherboard resources
0x000000E0-0x000000EF	Motherboard resources
0x000000F0-0x000000FF	Numeric data processor
0x0000F130-0x0000F137	Standard Dual Channel PCI IDE Controller
0x0000F120-0x0000F123	Standard Dual Channel PCI IDE Controller
0x0000F110-0x0000F117	Standard Dual Channel PCI IDE Controller
0x0000F100-0x0000F103	Standard Dual Channel PCI IDE Controller
0x0000F0F0-0x0000F0FF	Standard Dual Channel PCI IDE Controller
0x0000F0E0-0x0000F0EF	Standard Dual Channel PCI IDE Controller
0x0000F040-0x0000F05F	SM Bus Controller
0x0000F0D0-0x0000F0D7	Standard Dual Channel PCI IDE Controller
0x0000F0C0-0x0000F0C3	Standard Dual Channel PCI IDE Controller
0x0000F0B0-0x0000F0B7	Standard Dual Channel PCI IDE Controller
0x0000F0A0-0x0000F0A3	Standard Dual Channel PCI IDE Controller
0x0000F090-0x0000F09F	Standard Dual Channel PCI IDE Controller
0x0000F080-0x0000F08F	Standard Dual Channel PCI IDE Controller
0x000003B0-0x000003BB	VgaSave
0x000003C0-0x000003DF	VgaSave

0x000001CE-0x000001CF	VgaSave
0x000002E8-0x000002EF	VgaSave

Appendix B: Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

Level	Function
IRQ 9	Microsoft ACPI-Compliant System
IRQ 16	PCI standard PCI-to-PCI bridge
IRQ 16	Standard Enhanced PCI to USB Host Controller
IRQ 16	PCI standard PCI-to-PCI bridge
IRQ 11	Video Controller (VGA Compatible)
IRQ 11	PCI PCI Simple Communications Controller
IRQ 5	Ethernet Controller
IRQ 5	SM Bus Controller
IRQ 22	Microsoft UAA Bus Driver for High Definition Audio
IRQ 23	Standard Enhanced PCI to USB Host Controller
IRQ 8	System CMOS/real time clock
IRQ 0	System timer
IRQ 1	Standard 101/102-Key or Microsoft Natural PS/2 Keyboard
IRQ 12	Microsoft PS/2 Mouse
IRQ 4	Communications Port (COM1)
IRQ 3	Communications Port (COM2)
IRQ 13	Numeric data processor
IRQ 19	Standard Dual Channel PCI IDE Controller
IRQ 19	Standard Dual Channel PCI IDE Controller

Appendix C: BIOS Memory Map

Address	Device Description
0xA0000-0xBFFFF	PCI bus
0xA0000-0xBFFFF	VgaSave
0xD0000-0xD3FFF	PCI bus
0xD4000-0xD7FFF	PCI bus
0xD8000-0xDBFFF	PCI bus
0xDC000-0xDFFFF	PCI bus
0xE0000-0xE3FFF	PCI bus
0xE4000-0xE7FFF	PCI bus
0x7DA00000-0xFEFFFFFF	PCI bus
0x7DA00000-0xFEFFFFFF	Motherboard resources
0xF7800000-0xF7BFFFFFF	Video Controller (VGA Compatible)
0xE0000000-0xFFFFFFFF	Video Controller (VGA Compatible)
0xF7C2B000-0xF7C2B00F	PCI Simple Communications Controller
0xF7C00000-0xF7C1FFFF	Ethernet Ethernet Controller
0xF7C28000-0xF7C28FFF	Ethernet Ethernet Controller
0xF7C27000-0xF7C273FF	Standard Enhanced PCI to USB Host Controller
0xF7C20000-0xF7C23FFF	Microsoft UAA Bus Driver for High Definition Audio
0xF7C26000-0xF7C263FF	Standard Enhanced PCI to USB Host Controller
0xFF000000-0xFFFFFFFF	Intel(R) 82802 Firmware Hub Device
0xFF000000-0xFFFFFFFF	Motherboard resources
0xFED00000-0xFED003FF	High Precision Event Timer, HPET
0xF7C25000-0xF7C250FF	SM Bus Controller
0xFED40000-0xFED44FFF	System board
0xFED1C000-0xFED1FFFF	Motherboard resources
0xFED10000-0xFED17FFF	Motherboard resources
0xFED18000-0xFED18FFF	Motherboard resources

0xFED19000-0xFED19FFF	Motherboard resources
0xF8000000-0xFBFFFFFF	Motherboard resources
0xFED20000-0xFED3FFFF	Motherboard resources
0xFED90000-0xFED93FFF	Motherboard resources
0xFED45000-0xFED8FFFF	Motherboard resources
0xFEE00000-0xFEEFFFFFF	Motherboard resources
0x20000000-0x201FFFFFF	System board
0x40000000-0x401FFFFFF	System board

Appendix D: Digital I/O Setting

Below are the source codes written in C, please take them for Digital I/O application examples. The default I/O address is 6Eh.

C language Code

```
/*
 *      SMBus Device Register Reader program by Rex Chin. */
/*
 *----- Include Header Area -----*/
#include "math.h"
#include "stdio.h"
#include "dos.h"

/*----- routing, sub-routing -----*/
void main(int argc, char *argv[])
{
    int SMB_PORT_AD = 0x580;
    int SMB_DEVICE_ADD = 0x6e; /*75111R's Add=6eh */
    int i,j;

    printf(" Fintek F75111 DIO LED TEST Program Ver:0.1 \n");
    printf(" Warning: This tools is test only. \n");

    /* Index 10, GPIO1x Output pin control */
    SMB_Byte_WRITE(SMB_PORT_AD,SMB_DEVICE_ADD,0x10,0xff);
    delay(10);

    printf("All Digital I/O LED ON ... \n");
    /* Index 11, GPIO1x Output Data value */
    SMB_Byte_WRITE(SMB_PORT_AD,SMB_DEVICE_ADD,0x11,0x00);

    delay(3000);

    printf("All Digital I/O LED OFF ... \n");
    /* Index 11, GPIO1x Output Data value */
    SMB_Byte_WRITE(SMB_PORT_AD,SMB_DEVICE_ADD,0x11,0xff);

    delay(3000);

    printf("Digital I/O pin 7,5,3,1 LED OFF ... \n");
    /* Index 11, GPIO1x Output Data value */
    SMB_Byte_WRITE(SMB_PORT_AD,SMB_DEVICE_ADD,0x11,0xAA);
```

```
delay(3000);
printf("Digital I/O pin 6,4,2,0 LED OFF ...\\n");
/* Index 11, GPIO1x Output Data value */
SMB_Byte_WRITE(SMB_PORT_AD,SMB_DEVICE_ADD,0x11,0x55);
delay(1500);

}

SMB_Byte_READ(int SMPORT, int DeviceID, int REG_INDEX)
{
    outportb(SMPORT+02, 0x00);      /* clear */
    outportb(SMPORT+00, 0xff);      /* clear */
    delay(10);
    outportb(SMPORT+04, DeviceID+1); /* clear */
    outportb(SMPORT+03, REG_INDEX);  /* clear */
    outportb(SMPORT+02, 0x48);      /* read_byte */
    delay(10);
    printf(" %02x ",inportb(SMPORT+05));
}

SMB_Byte_WRITE(int SMPORT, int DeviceID, int REG_INDEX, int REG_DATA)
{
    outportb(SMPORT+02, 0x00);      /* clear */
    outportb(SMPORT+00, 0xff);      /* clear */
    delay(10);
    outportb(SMPORT+04, DeviceID);  /* clear */
    outportb(SMPORT+03, REG_INDEX); /* clear */
    outportb(SMPORT+05, REG_DATA);  /* read_byte */
    outportb(SMPORT+02, 0x48);      /* read_byte */
/* delay(10);
    printf(" %02x ",inportb(SMPORT+05)); */
}
```